THE CONTROL AND TREATMENT OF HYPERTENSION AND ARTERIOSCLEROSIS.

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THERE are a number of underlying facts which the diagnostician and the therapeutist must continue to bear in mind if he would successfully prevent the results of hypertension and influence the onward march of existing arteriosclerosis. To these facts I wish to allude.

Cardiovascular, more particularly arterial, changes furnish the fundamental morbid processes in the largest number of deaths after the fortieth year.

We are surprised when we examine our clinical material, more particularly that seen in private and consultation practice, to note the recent enormous increase of cardiovascular disease. We are promptly forced to the conclusion when this is compared with hospital statistics that there is an increase of the diseases of the arterial tree, coronaries, the myocardium, and in the nerve supply of the heart the further we are separated from hospital practice.

A careful study of the last 3,200 cases of internal disease seen in private and consultation practice offers food for reflection. These include :—

Arteriosclerosis	276
Endocarditis	135
Angina pectoris	44
Hypertension	67
Mitral obstruction	62
Aortic obstruction, vascular, endocardial (inflammatory)	151
Mitral insufficiency	267
Aortic insufficiency	20
Myocardial degeneration	277
Heart hypertrophy	63
Heart dilatation	59
Senile hearts	25

In a long hand-written report of the lectures of Benjamin Rush, which has recently fallen into my possession, that erudite clinician, of enormous experience and supposed unlimited clinical material, makes the statement that in all of his experience he has seen but one case of angina pectoris; and he mentions the name of another physician practising in Philadelphia who also had seen but one case.

Taking our clinical material into consideration, we are forced to the conclusion that hurry, worry, and excesses are at the bottom of a large majority of our cases in which we have degenerative changes in the cardiovascular system following a long or short period of hypertension.

That heredity plays an important *role* in many of our cases we cannot deny, but we are equally positive that if these patients who are burdened with this unfortunate tendency were cautiously watched and correctly advised by the physician, changes of a degenerative nature in heart and blood-vessels might be longer postponed.

This is particularly true of arteriosclerosis as it affects the coronaries and cerebral blood-vessels. It is not uncommon for us to get the history of three or four cases of coronary disease in one family, and we have family histories in which as many members of a family have died either of cerebral apoplexy or of other brain disease associated with vascular anomalies.

These positive facts teach a valuable lesson. The study of family history is too much neglected. Men who do not keep records, who do not question patients systematically, are very likely to overlook entirely the valuable facts which are gained by a thorough study of the patient's antecedents.

These may seem rather commonplace remarks, but the consultant is so frequently brought face to face with these facts, and understands so thoroughly their great importance, that the opportunity to present them ought not to be neglected.

Modern pathology makes clear beyond peradventure the further fact that there is a physiologic hyperplasia invading the intima during early life. We are forced to consider the separate artery as an organ, therefore a part of the body which has positive functions to perform; that its task is not single but multiple, and that the performance of its daily undisturbed work is attended even during the earliest years of life with a compensatory deposit for the preservation of these organs and the continuity of the circulation. As soon as this physiologic hyperplastic change of the intima because of age, overwork, strain, toxæmia, or from any other causes, is forced into a stage of hypertrophy we have the beginning of arteriosclerosis.

There is a considerable period of hypertension which precedes this profound change in the arterial tree which, however, in the majority of cases is not recognized because of a natural tolerance, and when present there is almost immediate compensation.

If hypertension persists unrelieved, and the factors which continue it remain uncontrolled, organic changes in vital organs are usually present—particularly in heart, kidney, and within the splanchnic area—before the patient presents himself with subjective manifestations.

In other cases, however, but limited changes during the early days of arteriosclerosis are sufficient to cause alarming symptoms, and not infrequently prompt death.

Thus there may be, early in the history of atheroma or arteriosclerosis, only a small lime plaque close to the mouth of a coronary artery, but of sufficient size to choke the heart without a second's warning by covering its mouth.

Hypertension long continued is the leading cause of arterial degeneration. It must be remembered, however, that arteriosclerosis once established, hypertension is not a necessary feature; arteriosclerosis may be present for years with normal, subnormal, or high blood-pressure.

Hypertension upon which we fail to make a favourable impression by rational treatment is already associated with changes in kidney, heart, or within the splanchnic area. We have failed to recognize the enormous extent of the splanchnics and their importance as pathogenic factors in the causation of hypertension and distant cardiovascular disease. The Germans have recently said "Happy is he whose splanchnics are normal and are offering no resistance to the circulation."

To prevent the baneful organic changes following hypertension we must recognize its presence early. Modern methods make this easy. Why not take advantage of these methods as we do of those which unearth kidney changes? To know exactly what resistance the heart has to overcome in the periphery is more important than to recognize the presence of albuminuria.

In considering the subject of hypertension we must remember the great clinical significance of the tightening and relaxation of the arteries of the body, the urgent need of separating the "two factors of the vessel wall and the contained blood."

Why not educate the masses in this direction, that the majority may escape the ravages of final degenerative processes? When the ravages of time force the individual to seek the oculist because of changes in the crystalline lens, and this organ is flattening, and glasses are needed to compensate, or they need to be changed for this retrograde process, he has become a fit subject for blood-pressure study. He is, most likely, in a period in which prophylaxis is demanded, and it will often lead to satisfactory results. When changes are found in distant organs it must be remembered that hypertension or slightly increased blood-pressure may prove an equalizer, compensatory, and ought not to be disturbed.

The sphygmomanometer has proven itself a very valuable adjunct in diagnosis. It is easily and frequently misinterpreted

and abused. No man should reach conclusions from the study of systolic pressure alone; if he would base treatment upon a firm basis he must think clearly, brace himself against one-sided reasoning, and give proper values to all data which are unearthed by the thorough consideration of subjective symptoms and the knowledge gained by physical examination: the sphygmomanometer furnishes but one strong link.

When we find, with evidences of hypertension or already present arteriosclerosis, accentuation of the second aortic sound, we know that "the door is being slammed"—the cusps forming the door—that there is a peripheral obstruction which heart and artery are trying to overcome, and we must act accordingly.

The point which the writer seeks to impress with greatest earnestness in presenting this paper is that if we would prevent arteriosclerosis we must consider the artery an organ with a capacity which is great for work, but which, when abused or overworked, insulted, or poisoned, revolts, and begins to degenerate. When you rob the heart of its sleep, you are damaging that organ and the entire vascular system. Sir Lauder Brunton, in his happy way, has recently said: "The heart practically sleeps more than the brain or the body, but the great distinction between the sleep of the heart and that of the brain is that the sleep is so short at a time." The heart and arteries demand thirteen hours of this sleep daily (this statement surprises those who have not computed the time). When robbed of this repose the periods of rest are shortened; cardiovascular organs are forced to work over-time, more rapidly than before; the foundation for retrograde process is laid. Nature will bear insult a reasonable time; the revolt will come sooner or later with unfailing certainty.

The final break in a large number of cases includes myocardial degeneration with all of its pangs. Hypertension and arteriosclerosis are increased less by the routine work of the

day than by the innumerable outside affairs and engagements which occupy so much of the time of the busy man (particularly the physician) as to cut his rest to a minimum. These workers hold the string taut, the tension under which they work is enormous ; their bearings are worn until at last the string snaps and we are called to repair and reconstruct, often when it is too late.

Hypertension will often lead to a strong suspicion of renal invasion. This is true when associated with hypertrophy of the left ventricle, though albumin be absent from the urine during a long period. The renal arteries may be far advanced in arteriosclerosis without invasion of other kidney structures which, when changed, add casts and albumin to the urine.

From the careful investigation of the diseases of the ductless glands we are convinced that these have a marked influence in producing arterial change, and that in considering the rational treatment of hypertension we are not to divorce ourselves from this possibility.

The production of arteriosclerosis in animals by the injection of adrenalin is proof positive of the correctness of this statement, and must have a decided bearing on the dietetics of hypertension and arteriosclerosis.

The younger the subject the more unfavourably does he react to hypertension and arteriosclerosis. Indeed, we are often justified in speaking of the presence of arteriosclerosis in the aged as a protective process—a true paradox.

If we would successfully control blood-pressure, we must have the hearty co-operation of the patient. He must be willing to surrender himself absolutely to his physician.

Carlyle's definition of genius included infinite attention to detail. Every possible bearing of the life and habits of the individual upon these destructive and degenerative processes must be taken into account by the therapeutist, and this in detail.

Romberg says: "Everyone acquires his arteriosclerosis within the circuit which he has taxed most." Upon this truth we are to act, particularly in attending early to local disturbances, to all intestinal anomalies, including chronic constipation, intestinal indigestion, and the dyspepsias. Even a distant irritation, as a stricture or unrelieved prostatic hypertrophy, may keep up hypertension and lead to arteriosclerosis.

Tobacco—*i.e.*, nicotine—influences blood-pressure very powerfully. Sir Lauder Brunton says:[1] "The rise of blood-pressure is so great that I have never seen it equalled after the injection of any drug, with the exception of suprarenal extract. The rise of pressure is chiefly due to contraction of the arterioles." The ultimate effect is to increase the rapidity of the heart. "When, however, the dose has been sufficiently large to quicken the pulse, no stimulation of the vagus will slow the heart, as its terminal branches in the heart are paralysed by the drug." I quote pp. 168 and 169, Brunton: "Usually, tobacco is employed by smoking, either in the form of cigars or cigarettes, or in a pipe. When used in any one of these forms, it is not pure nicotine which reaches the mouth, but really the products of the dry distillation of tobacco, containing a large quantity of pyridine and picoline bases. Probably nicotine in greater or less quantity is also present. The proportions of the pyridine and the picoline bases in the tobacco smoke vary according to the mode in which it is burnt. In a cigar there is freer access of air, so that much collidine and little pyridine are formed; while in a pipe much more pyridine is produced, and thus stronger tobacco can be smoked in a cigar than in a pipe. So much is this the case that tobacco which in the form of a cigar would produce no disagreeable effect, may cause giddiness

[1] "Therapeutics of the Circulation." P. Blakiston's Son and Co., Philadelphia, 1908.

and vomiting if smoked in a pipe. The smoke from a pipe or cigar usually passes simply into the mouth, and out again, either through the mouth or the nostrils; but when smoked in a huka or narghileh, the smoke is inhaled into the lungs, and this is frequently done by people also who smoke cigarettes. When a huka or a narghileh is used, the smoke passes through water before being inhaled, and it is thus deprived of most of its poisonous constituents; but this is not so with the smoke of cigarettes, and, as absorption occurs very rapidly from the pulmonary mucous membrane, cigarette smoking is sometimes very injurious. There is another reason, however, why cigarette smoking is frequently more harmful than smoking a pipe or cigar, and it is that cigarettes are small, and can be smoked in a few minutes, so that many more cigarettes than pipes or cigars are consumed in the course of a day, and the total quantity of tobacco used is thus much greater in the form of cigarettes.

"Smoking in moderation does not seem to be injurious to grown-up people, but there appears to be a general consensus of opinion that it is very distinctly harmful to growing lads."

Whatever conclusions we reach concerning the advantages or pleasures derived from tobacco by the healthy individual, it is absolutely interdicted in the presence of hypertension and arteriosclerosis.

Coffee raises blood-pressure because of the caffeine which it holds, and this rise is associated with increased rapidity of the heart's action. It makes the heart irritable, it increases the power of the heart's contractions, it places an extra load upon the kidneys, increasing the urine flow; the solids of the urine are increased by overtaxing its secreting cells. Because of these effects I have for some time held that men beyond fifty who get insufficient exercise or are brain-workers, and children before puberty, cannot with safety to themselves drink coffee. There is something in the coffee bean, besides the caffeine of

which it can be freed, which also acts as a healthful stimulant to brain and other organs which makes it a valuable article of diet.

A patent process is now being used in Germany by which the coffee bean is freed of 90 per cent. of its caffeine. This coffee has been largely used abroad during the past two years, with great satisfaction. There is scarcely a health resort in Germany which is not largely substituting this coffee for the ordinary coffee of commerce.

The taste of the coffee is not materially changed from that of ordinary coffee; the effect, however, upon the heart and blood-vessels is decidedly different. Patients who have never been able to take coffee, whose circulation, particularly the heart, has been unfavourably affected, are able to take it with impunity when freed of its caffeine. During the past year I have given it a fair trial, and am thoroughly convinced of its value and the desirability of using it in all cases of hypertension, arteriosclerosis, and irritable heart; indeed, I believe that it is the ideal coffee for all brain-workers or those of sedentary habits after the age of fifty. Blood-pressure is not increased by its use, nor is there palpitation or annoying systolic force.

The dietetic treatment of hypertension and arteriosclerosis is most important. No abnormalities from which we suffer are more favourably influenced by rational diet than are these conditions. The surcharged artery is always a menace to the individual. When the pabulum which it carries contains an excess of purin bodies, or of irritating substances of any kind, hypertension is increased and arteriosclerosis invited.

We have often been surprised by the routine and empirical methods which are practised in many sanatoria, here and abroad. In some of these, patients with hypertension are treated by what is known as the "flushing method." It is supposed that by giving quarts of water daily the noxious

substances which are floating in the blood are promptly eliminated. No thought is given to the distension of vessels, to the extra work given the heart and kidney which follows this irrational treatment.

Healthy elimination must of course be invited, but not at the loss of heart strength, nor by the over-distension of the artery or the overworking of the kidney. No physician who prefers the use of natural methods decries the influence of pure water, but we must raise our voices against its excessive and empirical use.

In connection with the subject of diet, we are again reminded of the overpowering importance of the study of the individual case. The tolerance of these patients must be tested before full directions can be given. In some we find a low carbohydrate tolerance; in others, purin bodies at once choke the furnace; in still others the digestive organs are so changed as to influence unfavourably the vascular system because of motor insufficiencies, either in the stomach or the intestines. In other cases we find that an ordinary diet is keeping up a hyperacid state which promptly leads to a train of symptoms, including joint changes, final gout, with associated cardiovascular disturbances. Modern methods make it possible for us to clear the horizon without great loss of time, but with great benefit to the patient.

Sufficiently reliable results for practice are obtained from the estimation of the purin bodies by the Walker-Hall apparatus, the uric acid output after the method of Rehmann; while the tests for irdican, ammonia, and other noxious substances are easily made by those who care to study these conditions thoroughly.

Patients with hypertension or arteriosclerosis demand continuous watching; articles of food may be tolerated at one time which, for unknown reasons, exaggerate symptoms and are harmful at other times. If we had our choice of treating

angina pectoris or coronary disease by a single method, I think we would all promptly choose the dietetic. It is surprising to note how much can be accomplished even with advanced sclerosis of the coronaries by a rational diet and proper living without the administration of a single grain of medicine. I know of no disease in which the results are so brilliant, following appropriate diet, as in angina pectoris. Patients who have had repeated severe seizures, who suffer from stenocardia on slight exertion, promptly yield to the diet which gives them just food enough, and not too much, which withholds from them the heavier and more indigestible articles of diet, who take but little meat, never more than once daily, often for days no meat at all, but who are preferably given eggs, fresh fish, easily digestible vegetables, and a limited supply of liquids. These patients demand the minimum of food that will nourish them. Many patients with angina pectoris have promptly lost their lives because of a *single dietetic indiscretion.*

I cannot express to you too forcibly my ideas on this subject in connection with this disease which has robbed us of so many brilliant colleagues.

The question of diet is of the greatest importance in connection with those cases in which there is a strong hereditary tendency.

Agreeable occupation which favours a quiet mental state is of enormous value in the treatment of both hypertension and arteriosclerosis. An exalted and overwrought brain must of necessity be associated with the tear which follows the abuse of that organ. This is at once associated with hypertension ; prolong it, and the associated pathologic conditions will not be long postponed.

I have recently had an example in a lawyer who was engaged in the promotion of an enterprise of enormous proportions, who was without hereditary taint ; in whom the

hurry, worry, and excitement, associated with the launching of this project, promptly led to enormous hypertension, even thickening of arteries, renal invasion, and death in the course of a few months.

These cases are not uncommon, and while the process is not always so rapid or widespread as in the case mentioned, subjective and objective symptoms are not long postponed.

Therefore to the busy brain-worker, whether he has hypertension or not, we are forced to recommend periods of quiet, prolonged rest, change of scene, proper exercise, and temperance in all things. While alcohol may not directly cause arteriosclerosis we are very sure that it does so indirectly, and that productive changes in kidney and other organs consequent upon its use calls upon the cardiovascular system for extra work which finally leads to change of a degenerative character. Individuals react differently to the social glass of wine or liquor. My experience has been that alcohol in any form is injurious in all cases of hypertension and arteriosclerosis, except in a final stage associated with myocardial weakness and broken compensation, to which I shall again refer.

We are all praying for the prolongation of life which is to follow the introducing of the lactic acid bacillus as suggested by Metchnikoff. To those of us who have turned the corner at fifty there is cold comfort in the statement of Metchnikoff, that if our lives are to be prolonged we should have to take advantage of the inhibitory action of the lactic acid bacillus during our early days. However, buttermilk is on trial as never before. Whether by suggestion, or by its inhibitory action on toxin producers in the intestines, it has seemed to make light the hearts of many.

The baneful effect of excessive coitus has not been thoroughly recognized by the profession. At any rate, the "hypertensine" and arteriosclerotic have not been sufficiently

warned against excessive indulgence. In some of our cases abstinence becomes imperative. This is particularly true of those types of vascular disease associated with arterial spasm.

We forget that the heart muscle is not the only true muscle concerned in the circulation of the blood. The skeletal muscles are as much a part of the circulatory system as are the capillaries, veins, or the lymphatics. A healthy circulation demands the assistance which it receives from the heart muscle, the arteries, capillaries, veins, lymphatics, and, not the least important, the skeletal muscles. The circulatory poise is best preserved by attention to all of these separate organs. The healthy stimulation of muscles by massage, proper exercise, with sufficient periods of rest, becomes exceedingly important in the treatment of the conditions which we are considering. Cases in which active exercise is out of the question demand passive movements. The Zander movements are particularly useful. It is unfortunate that we have in this country no such institutions as we find in Germany, rivaling each other, in which it is possible by means of the Zander apparatus to stimulate most muscles of the body, and to do this without danger to the heart or blood-vessels.

The introduction into therapeutics of the various devices perfected by Zander mark an epoch in mechano-therapy which has not been sufficiently appreciated by the profession.

In practice many well-selected cases of hypertension and arteriosclerosis are favourably influenced by warm and hot baths. I have observed the effects of these at Nauheim, Weisbaden, and Karlsbad, and make the statement knowingly that in well-selected cases, though the practice is empirical, the results are often reassuring.

No one health resort has a monopoly of hot carbonated or saline water. On the other hand, we cannot ignore the fact that an environment of success is not to be disregarded. The rest, change of scene, and divorce from active life are

unquestionably factors which make it possible to give the heart, arteries, and other organs that rest which is so much needed in these cases. If the patient will yield, is willing to rest at home, the Nauheim baths with resisted movements are often used to better advantage under his own roof than in the crowded hotels or boarding-houses of the health resort, or in the depressing atmosphere of seriously sick patients.

The discouraging factors with busy men are that they fail to take advantage of our suggestions, do not rest absolutely, continue the supervision of their interests from their homes, which often complicates matters and brings home treatment into disrepute.

Until within the past year I failed to recognize the value of high-frequency currents for the treatment of either hypertension or arteriosclerosis. During the past summer I had abundant occasion to note the effects of this treatment in Karlsbad under the direction of Dr. Buxbaum. Formerly, I attributed the relief of subjective symptoms to the overpowering influence of suggestion. I was promptly convinced, however, that this conclusion was unjust and found that this method of treatment had influenced a large number of cases favourably, that blood-pressure was reduced, and that subjective symptoms were relieved; and in some of the cases the relief continued during a number of months after a sufficient period of treatment.

We are not to conclude that this is a curative agent. It does, however, materially influence blood-pressure, and it does dissipate in many of these cases the annoying subjective symptoms. In advanced arteriosclerosis the blood-pressure is not likely to be reduced. In some the pressure may be raised by the treatment. The cases which react favourably are young subjects with hypertension or those who have symptoms of incipient sclerosis; here there is a lowering of blood-pressure with corresponding improvement in the

general condition. Laquer holds that in these cases the benefit is gradual but, as a rule, permanent. He also holds that where there is cardiac disease without arteriosclerosis good results are obtained by the local application of one electrode over the precordial region. How this agent acts I do not know ; that it is beneficial I am positive. I have seen cases of angina pectoris treated by this method, in which subjective symptoms were held under control during long periods. I do not refer to those cases with the larger attacks but to those in which the sternal pang and oppression were present at some time during each day.

I hear some of you ask what drugs have we to recommend for the relief of the conditions under consideration ? Drugs alone are inadequate to meet the indications offered, but there are drugs which may be given in connection with the methods of treatment already suggested which lead to material benefit and which in incipient cases may lead to cure. The preparations of iodine have for years been the sheet anchor of the therapeutist for the treatment of arterial disease. The great trouble in the average case is that the physician in giving his original prescription for the iodine fails to make clear the urgent need of long-continued treatment with these remedies. If the iodides are to relieve or cure they must be administered during months and even years. Patients who do not tolerate the potassium iodide often benefit by alternating the use of the strontium, rubidium, and sodium salts. I have found that the strontium aud rubidium salts are better borne than the sodium or potassium iodides. The more valuable iodides for the control of symptoms and the influencing of the underlying process are the potassium and sodium salts. It is very easy in the average case to establish tolerance by giving the strontium or rubidium salts first ; finally the sodium salts, then a long-continued period, during which the potassium salt is taken, and as time wears on a return either to the

sodium or rubidium iodide for a short time. The potassium salt, of course, is to be given during the longest possible period. Recently, there have been introduced other preparations which have also seemed to be efficacious, and readily borne. I refer to sajodin, tiodin, and eustenin. The profession has had a fairly satisfactory experience with sajodin. Tiodin is a preparation of iodine and thiosinamin. In occasional cases the tiodin has served very well. Eustenin has lately been introduced and is a combination of sodium theobromate and sodium iodide. It is a whitish, hygroscopic powder, soluble in water. Theobromin has been supposed to increase the blood-flow, and advances the blood-flow through these vessels ; also through the cardiac muscle, the iodides to dilate the vessels and cause a diminution of the viscosity of the blood. The combination of the iodine and theobromin in the form of eustenin has, in some cases in Von Noorden's and Jargie's practice, been satisfactory in relieving subjective symptoms and reducing blood-pressure. A number of years ago Huchard recommended the use of pure theobromin for the relief of sensory symptoms associated with coronary sclerosis. This drug has been given a fair trial ; the majority of those who have used it are willing to confirm Huchard's observations. Theobromin is particularly useful in cases of angina pectoris, also intermittent claudication or painful vascular spasms. I have been in the habit of prescribing not more than ·24 grm. of pure theobromin every morning and night in the average case. It is a purin body and ought not to be used in too large doses. In practice I have found that larger doses are likely to cause annoying headaches. Cases in which with myocardial weakness and coronary sclerosis there are almost continuous sensory symptoms are likely to show improvement from the frequent administration of small doses of the drug; ·12 grm. may be given every two or three hours according to the urgency of the symptoms. The salicylate of theobromin,

in my experience, is not as efficacious as is pure theobromin. Painful processes due to sclerosis, associated with myocardial degeneration, broken compensation, dropsies, in spite of the thickened arteries, frequently show wonderful improvement after the administration of powdered digitalis in ·1 grm. doses with ·6 grm. of the salicylate of theobromin. I have occasionally substituted for the latter ·24 of caffeine sodium salicylate. In these cases it is wise to combine with the digitalis treatment the daily morning administration of one tablespoonful of the saturated solution, either of Rochelle salts or magnesium sulphate in one half gobletful of hot water before breakfast. This will empty the splanchnics and act as a safety valve. In these cases, because of extreme weakness, an occasional glass of claret, Tokay, or even a small dose of whisky, or ethereal stimulant, preferably the ethereal tincture of valerian, will brace the patient and carry him over a critical period until the other remedies already suggested come to his rescue.

Persistent hypertension treated with the diet and methods of living suggested is often favourably influenced by the administration of the Lauder Brunton draught, the modified prescription for which I offer :—

℞ Sodii nitritis 3
Sodii bicarb., C.P. 32
Kalii nitratis 32
Aquæ q.s. ad 132
S. Shake well. Teaspoonful in gobletful of hot water before breakfast.

In rebellious cases of hypertension, usually associated with sclerosis, I give this remedy in the same dosage and in the same way before each meal. Small doses of chloral (·3 grm.) will, in many cases of uncomplicated hypertension, with attention to the digestive system and thorough emptying of the intestinal tract at short intervals by means of salines and the use of alkalies, cause a decided drop of blood-pressure and great relief of associated symptoms.

Pounding, irritable hearts, with hypertension, in which the systolic contraction is unusually strong, the area of cardiac impulse outside the nipple line, with or without vertigo, more or less discomfort referable to the head are, as a rule, relieved by the administration during two or three weeks, three times daily, of from 1 to 1·5 grm. of strontium bromide with from 2 to 4 drops of either tincture veratrum viride or an equal dose of tincture of aconite root. The nitrites, including nitroglycerine, sodium nitrite, and amyl nitrite are most useful in those cases of arteriosclerosis associated with sensory symptoms. For the continuous treatment of hypertension I would prefer the sodium nitrite with theobromin to any of the other vaso-dilators. For the relief of vascular spasm, and attacks of angina, where the physiologic action of the nitrite needs to be prompt, nitroglycerine, erythrotetranitrate, or amyl nitrite are preferable. Small doses of glonoin in extreme cases produce very little effect, only evanescent results. When we are face to face with danger in these cases only large doses of glonoin, preferably in liquid form, and not in tablets, dropped upon the tongue will produce the physiologic effect which is absolutely necessary to prolong life. The lives of patients with threatening death from cardiac spasm or true stenocardia have in my practice on several occasions been prolonged during many years by the administration of nitroglycerine in large doses, sometimes as much as 15 drops in a single dose.

We are not to be held by the rule which interdicts the administration of digitalis in all cases of hypertension, for occasionally in spite of high blood-pressure there are convincing evidences of myocardial weakness without marked fibroid degeneration, in which digitalis does yeoman's work. Such a case I have at present under observation, in which we hesitated to administer digitalis during a long period because of the serious sensory symptoms due to coronary disease, all of which yielded promptly after the use of digitalis, when systolic strength was established.

I am fully agreed that Mackenzie is correct when he makes the statement that "some of the most violent attacks of angina pectoris have occurred in people in whom the exhaustion of the heart was temporary, and the restoration of reserve force resulted in a complete cessation of pain and in permanent recovery." Some of these I have treated with small doses of strychnine and ·3 grm doses of lactate of lime.

In the treatment of both hypertension and arteriosclerosis we receive valuable indications from the consideration of the general condition of our patients and the constitutional treatment accordingly administered. With associated renal complications and anæmia the chlorides are particularly valuable. We must continue to keep before our mental vision the urgent necessity of conveying to the heart and entire system the pabulum which it demands, including an abundance of oxygen.

The life of the Venetian Doge Cornaro, who presented a discourse on "The Art of Living Long," has never ceased to interest us. It is a classic, and should claim your attention.

Cornaro had, I dare say, subjected himself to overwork, and possibly to many other baneful influences, in spite of which he reached his 83rd year. He appreciated the fact that he had made many mistakes, and that he was fast nearing his end. His later experience justified the production of a series of articles, "Wherein the Author details the Method by which he Corrected his Infirm Condition, and Strengthened his Naturally Weak Constitution, and Thenceforth Continued in the Enjoyment of Perfect Health." He lived to be over 100 years old, enjoying to his last day the full possession of his faculties, and many other pleasures which he was quite sure he would not have enjoyed had he disobeyed the laws of Nature. A single quotation is justified :—

"Divine sobriety, pleasing to God, the friend of Nature, the daughter of reason, the sister of virtue, the companion of

temperate living, the loving mother of human life, the true medicine both of soul and body, how much should men praise and thank thee for thy courteous gifts, for that gives them the means of preserving life in health, that blessing which it did not please God we should have a greater in this world, life and existence so naturally prized, so willingly guarded by every living man."

This paragraph contains the essence of therapy, which the thinking physician must apply against hypertension, whatever the cause.

I wish to add that Hag, of Bremen, several years ago brought to the notice of the profession the coffee, which he had treated by a patent process, from which all but about 10 per cent of its caffeine had been eliminated. I have had considerable experience with this caffeine-freed coffee, have watched its effect, and am very positive that it is not followed by the baneful results on the heart which follow the use of the ordinary coffee in too many cases. Blood-pressure is not raised by it. Those who cannot drink coffee at night without being kept awake drink this coffee with impunity. *It is not a substitute for coffee but a true coffee.* Looking at the bean which has been treated by this process one sees no difference at all, and there is very little difference in the taste of the coffee when properly prepared. The dispensers of the coffee in this country, who are chemists, examined the green bean before and after roasting, and attest to the correctness of Hag's contention. This coffee may be used by those who do not bear ordinary coffee well, those who have arteriosclerosis and irritable hearts, and in well-selected cases of nephritis.